

*Conceptual Operational Plan  
Alternative H - Chain of Lakes Conveyance*

**Operational Assumptions**

- This operational storyline is founded on an assumption that any diversions into the lakes conveyance system which is pure storage will not be counted against the Salinity Control Plan export ratios of 35/65% in February through June and 65/35% in July through January. Some provisions will have to be made for meeting the X2 requirements and providing the Spring flows which the export ratios help to support.
- The multiple, small diversion facilities are equipped with state of the art cylindrical rotating screens which operate at a high efficiency rate and are less disruptive to fish migration. However, during certain periods - mainly in the spring - the fish screens, and therefor the diversion must be throttled back or shut down completely to protect important native fish or outmigrating anadromous fish.

**Operation of the Components of the Alternatives**

**Ecosystem**

- Shallow water habitat, wetlands, and riverine habitat restored in the Delta and created in conjunction with the storage lakes combined with restored riverine channel features in the Sacramento and San Joaquin Rivers, and wetlands created in floodway corridors will provide the ecosystem functions necessary to stabilize and enhance fish populations in the estuary. This stabilized and enhanced fisher population will resolve much of the current conflict between fisheries and diversions and lead to a more reliable water supply.
- Efficient fish screening facilities installed on the water diversion facilities located in the Hood through Freeport area of lower tidal influence (providing more efficient screen designs through smaller variations in river velocities) on the Sacramento River will screen the isolated conveyance facility intake in a manner which provides for bypassing screened fish back into the main channel of the river. This will provide higher survival rates than the current fish screening facilities located in the South Delta and lead to a stable ecosystem and a more reliable water supply

**Water Supply**

*Average year and above*

- Flood flows can be conserved by skimming the falling leg of flood flow hydrographs and stored in the chain of lakes (300 to 700TAF) within the Delta. To the extent that the capacity of the existing aqueducts exceeds the weekly demand on the projects - that water can be transported during the winter months to existing surface storage (San Luis Reservoir, other project reservoirs, groundwater banking and conjunctive use programs in the San Joaquin Valley developed as part of this alternative, and other storage within the water district service areas) and groundwater storage south of the Delta. Since

it is likely that the south of Delta storage will at times limit the capability to transfer Chain of Lakes storage to other storage south of the Delta, this operation would work more effectively if additional south of Delta storage were part of the alternative or was provided in the service areas.

- During the spring months Sacramento River flows can be augmented by allowing Oroville and Shasta inflows to pass through unregulated to the extent that water skimmed from the hydrographs earlier in the year and stored in the Chain of Lakes or transferred south of the Delta can offset this pass through flow. The water skimmed from the flood hydrograph and stored south of the Delta also makes it possible to throttle back or shut down diversions through the fish screens on the Chain of Lakes facilities during sensitive periods for the fishery.
- A portion of the conserved water produced during the spring period as a result of the demand management actions in all the urban service areas and ag land retirement in the San Joaquin Valley can be dedicated to augment spring outflows for the fishery. The remaining portion can be conveyed in the Chain of Lakes conveyance facility (in the case of the Projects) to south of Delta storage to augment water supplies. In the case of upstream exporters, that portion can be retained in upstream storage, conveyed to conjunctive use basins, conveyed to groundwater storage within the service area, or used to make spring consumptive demands.
- Conserved water still parked in Shasta or Oroville at the end of the operational year which needs to be transferred to south of Delta storage to achieve flood storage limitations by about November 1 of each year can be transferred to such storage - and more efficiently by an Chain of Lake isolated facility since the fall is the highest carriage water cost period to effect the hydraulic barrier to salinity intrusion. It is also possible that by transferring water from Oroville to south of Delta storage in the fall and winter - increasing the flood control storage space - flood peaks can be regulated and spills reduced. If there are opportunities to transfer this storage to south of Delta during the winter and spring period this could create more opportunities to increase spring flows or to throttle back diversions at the fish screens during sensitive fish passage periods.

### *Dry and Critical Years*

- The Chain of Lakes storage and isolated conveyance facility does have the capability to increase spring flows for the fishery during dry and critical years. When combined with sufficient south of Delta storage (surface and groundwater) that can take advantage of conserving high flows in average and above years, there is considerable potential to augment river flows - the amount of augmentation is a function of the size of available storage both in the Delta and south of the Delta.
- Conjunctive use in the Sacramento Valley can be tied to the surface storage in the Delta provided by this alternative and the storage provided in existing storage reservoirs in the Sacramento Valley to effectively use this concept to augment river flows or facilitate water transfers of stored groundwater through the isolated facility. Administrative arrangements would need to be made to provide surface water to conjunctive use basins during average and above years from existing storage reservoirs in the Sacramento Valley and offset that surface delivery with water conserved in the Chain of Lakes facility.

- Conjunctive use programs and groundwater banking developed in the San Joaquin Valley as part of this alternative can be drawn on in Dry and Critical years to offset augmented spring flows for fisheries and to provide water supplies.
- To the extent that stored reservoir water is available north of the Delta to transfer during dry and critical years the Chain of Lakes isolated conveyance facility can effect the transfer more efficiently than the existing system. This efficiency comes from the capability to eliminate the high carriage water cost typically associated with maintaining a hydraulic barrier to salinity intrusion induced by south Delta pumping during summer and fall months of Dry and Critical year types.

## Water Quality

- The full sized conveyance facility contained in the Chain of Lakes alternative will deliver high quality water year round to both urban users and to agricultural. This will significantly improve the quality of drinking water available in urban areas and significantly improve the quality of irrigation water - leading to large water quality improvements in aquifer return flows to the San Joaquin River. It will also reduce heavily the total salt load to the San Joaquin Valley.
- Portions of San Joaquin Valley agricultural drainage will be retained in underground pipe storage during late summer and fall and then metered out to the river during high flow periods when water quality is higher.
- Water developed or purchased in the San Joaquin Basin will be available to provide dilution and flushing flows to improve water quality in the San Joaquin River and the South Delta.
- Source control actions for urban stormwater, point and non-point source controls for agricultural runoff and drainage will reduce the volume and concentrations of runoff into the San Joaquin River.
- Retention of a priority portion of Delta island agricultural drainage and treatment in wetland complexes will improve the quality of Delta channel water quality for drinking water purposes.
- Reclamation projects will decrease the demand for Delta withdrawals by 300 to 700 TAF. Projects in the Bay Area can be investigated for the potential to store reclaimed water to be used to release to the Delta in the vicinity of Chipps Island to assist with achieving X2 standards in the February through June timeframe and to assist with maintaining a hydraulic barrier to salinity intrusion in the July through November timeframe.